SCIENCE.

FRIDAY, AUGUST 7, 1885.

THE INTERNATIONAL SANITARY CONFERENCE AT ROME.

EPIDEMICS are not an unmixed evil. Indeed, it would perhaps not be going too far to say, that, on the whole, they are productive of more good than harm. They call attention to sanitary sins, and lead to sanitary reforms, which, in the absence of such a special stimulus, would often not be made. As a result of these reforms, the mortality from endemic diseases is, no doubt, often reduced to an extent which would quickly leave a balance on the credit side if a careful life-account were kept with cholera or yellow-fever in areas outside of their endemic prevalence. Thus, for example, the epidemic of cholera in Naples last year has been the cause of a general sanitary awakening in that city, which has long been noted as a hot-bed of typhoid-fever and other preventable filth-diseases. It has led to the speedy completion of the new water-works, by which the city secures an ample supply of pure water; and the municipal authorities are now earnestly inquiring as to the best system of sewerage, with a view to introducing it as soon as possible. By the way, the writer suggested to the syndic (mayor), that the 'separate system' of Col. Waring would be best adapted to the special conditions found at Naples; and this suggestion received the indorsement of the famous Dr. Koch, delegate from Germany to the International sanitary conference.

One of the most prominent indications of the general agitation of measures relating to sanitary reform, which in civilized countries follows an epidemic, is the disposition on the part of a country which has been recently punished, to call upon its neighbors to make common cause with it against the deadly pestilence. Thus the International sanitary conference of Constantinople (1866), that of Vienna (1874), and that recently called by the Italian government, which met in Rome on the 20th of May of the present year, have all been the direct result of a recent epidemic of cholera; while the incentive which caused our own government to invite other nations to send delegates to the International sanitary conference held in Washington in 1881, was the epidemic of yellow-fever which devastated the Mississippi valley in 1878, and re-appeared in Memphis in 1879. The object in view on the part of the various governments which have taken the initiative in calling together sanitary experts for an international conference, has been to establish by treaty an international and uniform code of sanitary regulations. Unfortunately this object has not yet been attained. Whether the conference of Rome will be more fortunate in this respect than its predecessors have been, remains to be seen; as it has not yet finally adjourned, but is to meet again in the autumn. In the mean time, the delegates are to confer with their respective governments, and to present for their consideration the conclusions reached by a sub-commission composed of the technical delegates, which must serve as the basis of an international convention, if one is finally arranged. Even if this desirable result is not attained, the conference, like those which have preceded it, will be productive of great good, especially in the country where it was held. The interchange of opinions among leading sanitarians from various countries, the formulating of the knowledge which has been gained in the laboratory, or by the practical management of epidemics, the publication of explicit directions relating to quarantine, disinfection, municipal and maritime sanitary supervision, etc., cannot fail to be useful. And, even if no novel preventive measures have been brought forward, the reiteration, with the authority of such an assemblage of experts, of well-recognized san-

itary axioms, is of the greatest importance. For it is only under the stimulus of a recent epidemic, or the fear of one in the near future, that those who devote their lives to sanitary science can secure the attention of legislators, and of the public generally, to the truth of these axioms, and to the fact that cholera and yellow-fever are, to a great extent, preventable diseases.

Upon two things the sanitarians assembled at Rome, with two or three exceptions, were agreed: *First*, that cholera invades countries at a distance from that part of India where it exists as an endemic disease, not by *de novo* development, nor by any independent power of extension, but as a result of human intercourse. In other words, that new centres of infection are established by the transportation of germs from previously infected localities, either by fomites, or by means of the dejections of the sick. *Second*, that certain insanitary local conditions are essential for the development of an epidemic when cholera-germs are introduced; and that in a city which has a pure water-supply, and which is in a perfect sanitary condition, cholera cannot establish itself. So thoroughly are the English delegates to the sanitary conference convinced of the truth of this latter proposition, and so well are they satisfied with the present sanitary condition of their country, that they are willing to trust entirely to local sanitation, disinfection, and isolation of the sick, and insist that quarantine restrictions of any kind are unnecessary. In proof of this they point to the fact, that, for years, there has been unrestricted communication between the cholera-districts of India and England; and that, nevertheless, the disease has not been introduced into the latter country.

Other countries of Europe, however, are not willing to trust alone to local sanitation. They say, We admit that with plenty of money, a city may in time be made cholera-proof, especially if its inhabitants have been educated in ways of cleanliness, and if it is not located too near the tropics. But the cities and towns of southern Europe are not in this condition, and it is hopeless to think of effecting such radical sanitary reforms on short notice. We therefore demand the establishment of barriers for the arrest of the infectious principle, or germ, which comes to us from your Indian possessions, and most frequently by way of the Red Sea and Suez Canal. In addition to this, we propose to guard our ports of entry, and to depend rather upon the exclusion of cholera-germs than upon the hopeless task of effecting such sanitary reforms as will make it safe to open the doors for their unrestricted introduction.

England replies, through her delegates to the conference at Rome, Guard your ports as closely as you please, but leave us free to pursue such methods as we have heretofore found efficient; and *don't interfere with our commerce* by detaining ships which are sailing directly from India to English ports by way of the Suez Canal.

As to the quarantine restrictions necessary, there is the widest range of opinion among the delegates to the conference at Rome. Some insist upon the old-fashioned arbitrary quarantine of detention for all ships and persons coming from infected ports, and differ only as to the time of detention. For these, from seven to ten days after arrival is the shortest time which can with safety be admitted. In this old quarantine party are the delegates from Turkey, Spain, Brazil, Greece, Roumania, and one or two other second or third rate powers. On the other hand, the delegates from France, Germany, Italy, Austria, Russia, the United States, and several other nations, advocated a more flexible system, which should take into account the sanitary condition of the vessel, the time she has been at sea since leaving an infected port, or since the last case of cholera occurred on board, etc. This system, commonly spoken of as the system of 'medical inspection,' includes the isolation of the sick; disinfection of soiled clothing, excreta, and of localities exposed to infection, including ships; and detention of the well for observation for a limited period — three to five days — if they have been recently exposed to infection.

The French delegates insisted upon dividing the passengers into isolated groups, so that each group might be released separately at the expiration of five days from the occurrence of the last case. Other delegates objected to any detention for a longer period than is necessary for the thorough disinfection of the vessel and the personal effects of the passengers. This modified system of quarantine, or 'medical inspection,' if well executed, and with the application of approved methods of disinfection, would doubtless afford the greatest possible security with the least possible interference with commerce, and injustice to individuals; whereas the old-fashioned quarantine is regarded by the more enlightened nations of Europe as untrustworthy and barbarous. Dr. Koch, the discoverer of the 'comma bacillus,' was in favor of the system of medical inspection as above defined.

It would be out of place in the present paper to give more in detail the conclusions reached by the conference with reference to sanitary regulations to be adopted at the port of departure, at sea, and at the port of arrival, the special measures recommended for the Red Sea and Suez Canal, the directions for disinfection, etc. But, as showing in outline the general sentiment of the delegates with reference to the most important preventive measures, we may quote the following proposition, which was introduced on the last day of the session by the delegate from the United States, and was adopted with but a single negative vote (Turkey).

"The measures recommended against cholera are, in general, applicable to yellow-fever, and to other diseases which prevail in epidemic form under the influence of bad sanitary conditions, and which are transmitted by human intercourse.

"The most effectual means for preventing the propagation of diseases of this class are: The sanitary improvement (*assainissement*) of seaport towns, and of vessels sailing from infected ports; isolation of the sick; and disinfection of infected or suspected articles and localities."

Baltimore, July 30. GEO. M. STERNBERG.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

An abnormal Rudbeckia.

An interesting specimen of Rudbeckia hirta, L., was recently found among a patch of plants by my brother, Mr. Davis L. James. It differs from the normal type in such a manner as to deserve notice. It had the ordinary form, with the black conical centre. There were thirteen yellow rays. Two of these were of the usual shape, ligulate, with notches at the end; three were tubular, and with five lobes; and the remainder split open near the end, and the ray spread out. All the rays were *fertile*, although the generic character is 'rays neutral' (Gray, 'Manual,' p. 254). There can be no doubt as to the species, as it is a very common and familiar plant in this neighborhood. The sketch shows the appearance of the flower. It seems almost like an intermediate stage between the typical composite and a blossom with a number of large tubular flowers in a head. Can it be a reversion to some ancestral form?



JOSEPH F. JAMES.

Cincinnati, O.

The ginkgo tree.

Some years ago I received fruit from the Ginkgo (Salisburia adiantifolia) from Tennessee, and since then I have heard of a number of cases. My impression is, that, in the latitude of southern Pennsylvania and Virginia, it is rather common for this exotic to fruit.

WM. H. BREWER.

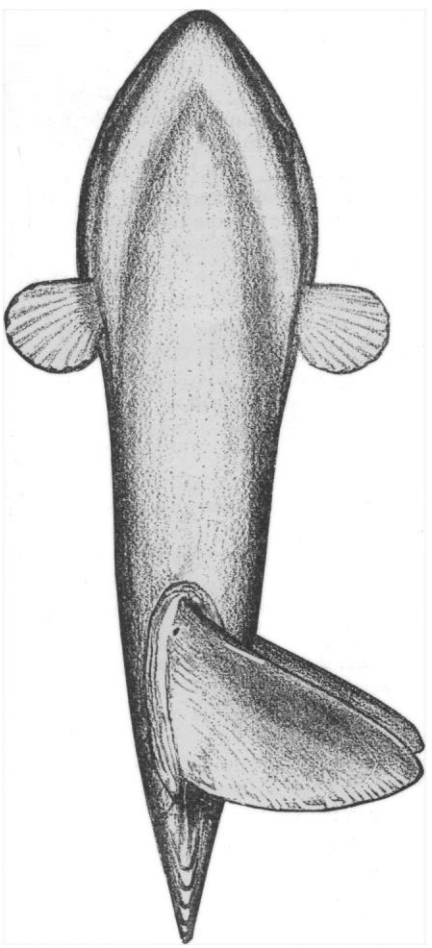
New Haven, Conn., July 28.

The swimming-habits of the sunfish.

The accompanying figure may at first puzzle the reader, but a little explanation will make it comprehensible. It is a view of the sunfish, or Mola, as seen from the back, the beholder looking down upon the animal from above as it swims in its own peculiar way. The individual from which this sketch was taken was caught in a trap-net at Quisset Harbor, Mass., and afterwards towed in a strong bag-net with a steam-launch from Quisset to Wood's Holl, where it was placed in one of the large pools constructed south of the laboratory for the Fish commission under the direction of Professor Baird. The fish measures about five feet in length and three in width: in fact, it may be considered adult. Since its removal to its new home, the animal seems quite contented, and has afforded an unusual opportunity to observe the manner in which its fins are used. The manner in which these organs are moved is so peculiar that it has been thought advisable to give a brief account of the means by which they are made effective as locomotive organs.

One does not need to watch this fish long in its

native element to discover that the great dorsal and anal fins are almost its sole organs of propulsion. In the figure, both are shown with their tips thrown over to the right side. This movement is synchronous in these great fins; that is, both strike in the same direction at the same time. But the most remarkable feature about them is, that they are twisted into the form of the blade of a propeller-wheel at the commencement of each stroke, as shown (not very clearly) in the figure, where the foreshortened dorsal is indicated in the condition which it presents at the moment



MOLA ROTUNDA (viewed from above, $\frac{1}{12}$ nat. size).

when the stroke to the left is about to begin. The direction of the peculiar twist of these fins is also reversed at each successive stroke, in opposite directions, so that a most effective propelling apparatus exists, which it would be somewhat difficult to imitate by a mechanical device. This contrivance is rendered all the more effective in consequence also of the great width of the fish, by which great stability is secured.

A very peculiar soft oval ring of dermal tissue around the bases of the dorsal and anal, renders them readily movable by means of the tendinous terminations of the muscles which are inserted into the strong bases of their rays. A similar band of soft dermal tissue is found on both sides of the base of the broad, crenulated, rigid tail, which is moved on its base just as the rigid rudder-blade of a vessel is moved by means of the rudder-chains. In the case of Mola, however, the single pair of rudder-chains as found in a vessel is replaced by a single series of tendons on either side of the median line, running parallel, and passing through round canals in the soft elastic base of the caudal, and inserted into the bases of the caudal rays.

The office of the curiously modified caudal of Mola seems to be solely that of a rudder, no vibration whatever of the tail being apparent when the animal is swimming in a straight line. Only when the creature wishes to turn is it deflected from the median line at its tip; and even then its apex sweeps through an arc of not more than twenty-five degrees at most, usually much less.

The pectorals are comparatively small, and, in swimming in a straight line, are extended horizontally and kept rigid and motionless by the animal, as if merely for the purpose of keeping the body vertical. When swimming with the sides of the body at an angle with the plane of the horizon, one or the other of the pectorals is folded closely against the side.

It thus becomes evident that Mola uses almost exclusively the dorsal and anal fins as locomotive appendages, and that the tail and pectorals act respectively as the rudder and as balancers, and take no active, but only a very subordinate, share in effecting the creature's movements. Even the rudder-like tail may be said to be defective; for it was noticed that the fish, when first placed in the pool, was unable to turn quickly enough to avoid bumping its snout against the stone walls at the angles of the enclosure.

The organization of this creature is probably the most remarkable of any encountered amongst the Teleostei. The body is incased in a very thick inflexible skin, and all of the lateral musculature has become subordinated to the office of flexing the vertical fins. In fact, so extreme has been the muscular specialization, that the myotomes have been entirely suppressed, and the lateral muscular masses developed into long muscles, ending in tendons.

No less remarkable has been the mode in which the tail has been developed through a larval form, probably provided with a lophocercal tail, which has already disappeared in the stage represented by Molacanthus. Mola, in fact, is the best-known example of a type having a gephyrocercal structure. No less extreme is the modification of the cerebro-spinal nervous system; for, as a result of the muscular specialization already noticed, the medulla spinalis has been excessively abbreviated. We are, accordingly, forced to admit, that Mola is the most extremely modified teleost in existence, notwithstanding the fact that a great many very singular deep-sea forms have been described within a very recent period.

The great advantage of having the large pools of salt-water enclosed by heavy stone walls also becomes very apparent in the instance of Mola, and shows how valuable they may become as aids in the study of the habits and modes of life of such large marine forms as dolphins, porpoises, sharks, swordfish, etc., — types in which the Fish commission is interested, as affecting the abundance of certain of the food-fishes.

JOHN A. RYDER.

THE FRENCH ACADEMY IN ITS ORIGIN.

"I UNDERTAKE, since you request it, to write down what I know of the French academy, — a society about which many people talk, but which few people know as it ought to be known."

These are the words with which Pelisson, the original historian of that famous society, began his narrative. Notwithstanding the charm of his graceful style, the exact additions to the record which were made by the Abbé Olivet, and the much more recent notes of Livet, to say nothing of Kerviler's readable bibliography, and Arsene Houssaye's witty and satirical criticism, the French academy remains to this day as it was in 1653, when Pelisson's story was first anonymously published, — "a society about which many people talk, but which few people understand." Now and then some enthusiastic English or American writer proposes an English or an American reproduction, or a critic skilled in the poise of conflicting ideas sets forth the possibilities and the difficulties of organizing such an imperial agency, amid the de-centralized institutions of Great Britain and the United States. Matthew Arnold concludes his famous essay on this subject by a sentence in which admiration is tempered with doubt. "An academy," he says, "quite like the French academy, — a sovereign organ of the highest literary opinion, a recognized authority in matters of intellectual tone and taste, we shall hardly have, and perhaps we ought not to wish to have it." We may venture to add, that, if London cannot have its literary court to exercise an acknowledged supremacy within a prescribed domain, New York and Washington must wait awhile before their political or financial power can originate a society which will be potent in the promotion of letters.

Nevertheless, the growth of the French academy, and its influence upon the scientific, as well as the literary, progress of France, are quite worth studying. It is the parent of the Institute of France, but it is the child of a modest coterie of literary people such as may be found in almost every cultivated town. Its extraordinary growth is due in no small degree to that innate love of symmetrical organization, or of good form, which the French exhibit in many phases of their activity. It owes not a little to the power of the monarchy in the days of Louis XIV.

The French academy is always spoken of as founded in 1635, but several years before that date its nucleus was in existence. As early as 1629, a number of bright men living in different parts of Paris, suffering from the social impediments of a great city, and finding it inconvenient to pay visits without finding their acquaintances at home, determined to have a weekly meeting at a private house. They were men of letters, above the average ability, associated like our literary clubs, by the principle of good fellowship, with the slightest possible regulations, and having at first no higher purpose than familiar and friendly conversation on business, news, and literature, the interview ending with a promenade or a collation. If any one of the company wrote something on which he wished genuine criticism, here was his opportunity to receive unguarded and honest comments. In later years the members of the academy looked back to this golden age of its infancy, when all that is bright and charming in literary society was enjoyed without noise, parade, or animosity. To avoid the intrusion of unwelcome fame, even the fact that there was such a club was for a long time not mentioned to those who were unconnected with it.

But such light could not long be hidden beneath a bushel. One by one, outsiders heard of that charming circle which was not engaged in the exchange of compliments and flattery, but which openly and boldly pointed out to the members their literary faults. All this Arcadian chapter is charmingly told by Pelisson, whose narrative we are following as others have so often done before. Boisrobert was then in high favor with Richelieu, — the one to whom the Cardinal's physician referred when he said, "Monseigneur, I can prescribe nothing more for you but two drams of Boisrobert after dinner." From this source the great minister of France heard of the brilliant coterie which met at the house of Conrart. The far-sighted sagacity of Richelieu perceived the possibility of giving public authority to these self-contained critics, and through Boisrobert he offered to become the protector of the club, and to give it the authority of *Lettres patentes*. His proposals were gladly accepted as honors from the crown, and after due deliberation and formalities, the charter passed under the royal hand and seal in the month of January, 1635. This document is far more interesting at this late day than most such official papers. It abounds in lofty sentiments admirably expressed. It recognizes the conferences which have been held by the pre-existent 'assembly;' it confirms and defines their purpose to be the promotion of eloquence, that is to say, of skill in the use of language; it bestows upon the

infant society the name which has now become historic; it limits the membership to forty persons; and it confers upon the chief and protector, Cardinal Richelieu, the authorization of officers, statutes, and by-laws. Various other names had been proposed, — l'Académie des beaux esprits, l'Académie de l'éloquence, l'Académie éminente, — but finally Académie française was selected, because it was more modest and more appropriate.

The original statutes define in much detail the sphere of the academy, and its methods of procedure. Its purpose is thus stated in the twenty-fourth article. "The principal function of the academy will be to labor with all possible care and diligence to give certain rules to our language, and to make it pure, eloquent, and capable of treating the arts and the sciences." In subsequent paragraphs, provision is made for the distribution of the best French authors among the academicians who are to make a note of such words and phrases as suggest general rules of correct expression, the entire academy being the judge of what is thus presented. The preparation of four works — a dictionary, a grammar, a rhetoric, and a poetry — is projected. At every regular meeting, one of the academicians, in his turn, is to present a discourse in prose, reading it or reciting it as he chooses. He may select any theme, but must restrict himself in delivery to fifteen, or, at most, thirty minutes. The rest of the session is to be devoted to the examination of works which have been presented to the academy, or to the prosecution of the four great tasks already mentioned. Every discourse before the academy is to be referred to two censors, who shall report within a month their observations upon it, and the author, within the following month, shall submit to the commissioners the corrections which he may have made in accordance with their suggestions. Similar steps are to be taken in respect to other works submitted to the judgment of the academy. Brief rules are laid down to make the criticism truly effective. The commissioners or censors are not to keep copies of the papers they examine, nor of their observations upon them; faults are to be pointed out with deference and courtesy. The corrections are to be received in the same spirit; the approbation of the academy will be expressed without praise, and in accordance with a prescribed formula. Works indorsed by the academy, after such scrutiny as has been mentioned, may be published 'by order of the French academy;' but no academician may indicate his membership in the academy on the titlepage of a work not submitted to the criticism of his associates, or not approved by their action. The rules which the academy prescribes in respect to language or orthography must be followed by all the academicians in prose and verse. All revelation of the confidences of the academy, in criticism or praise, is forbidden under penalty of disgraceful and irremediable expulsion.

By these severe methods, the literary men in Paris, in the middle of the seventeenth century, endeavored to hold themselves and their countrymen up to a high standard of literary excellence. The results have been apparent from that time to this, in the clearness, the fitness, and the grace, which have characterized French writers, not only those of genius and erudition, but those of humbler standing. In later days, other academies in Paris have shared with the French its lofty rank; and perhaps there is less reason now than there was two centuries ago, for such concerted action in the improvement of the French language, and in the promotion of a pure style; yet no one can read the story of those primitive days without admiration for the spirit which conceived this lofty idea of the benefits of literary criticism, severe and considerate, and which upheld the advantages of co-operative efforts in the advancement of letters. Among all the literary clubs of the world, none has attained to such acknowledged authority, none has come so near to immortality, none has had such wide-spread influence, as that which sprang into life at the magic touch of Richelieu two centuries and a half ago.

EXPLORATION IN INDO-CHINA.[1]

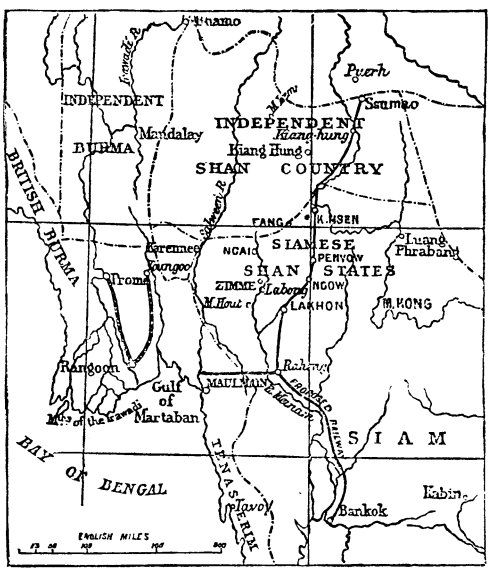
On the 12th of December, 1883, I left London for Liverpool, and embarked the next day for Rangoon.

Luckily I was introduced to the Rev. Dr. J. N. Cushing before leaving the steamer, and, as he was the best-known Shan scholar, and had previously traversed part of the country I intended to explore, I induced him to join my party. Having procured the necessary passports, and paid my official calls, I left for Maulmain to make arrangements for the journey.

On the 12th of January I sent my boys on with the luggage to Shwaygoon, a town some sixty miles distant from Maulmain up the Salween River, and followed with Mr. Ross, of the Bombay-Burmah trading company, on the 15th, in a steam-launch. The same day we left in carts for Hlineboay, where we arranged for hiring elephants for both of our parties. Returning to Shwaygoon, I made a boat-journey up the Salween as far as Yembine, to see whether it was practicable to carry a railway in that direction. On my return to

[1] From an article by Holt S. Hallett in the London *Graphic*.

Shwaygoon, on the 20th, I found that Dr. Cushing and the remainder of our party had arrived there. The next day we left with seven bullock-carts, and after a good ducking in the Hlineboay River, owing to our driver missing the ford, reached Hlineboay, where we found that the Burman magistrate had procured fourteen elephants, — six for our party, and



MAP SHOWING PROPOSED RAILWAYS.

eight for that of the Bombay-Burmah party, which wished to accompany us as far as Maingloongyee. As the latter party had not arrived by the 23d, I determined to start, and make short marches until they overtook us. Having secured a guide who could speak Burmese, Talain, and Karen, to come with us as far as Maingloongyee, we mounted our elephants, and I commenced the survey.

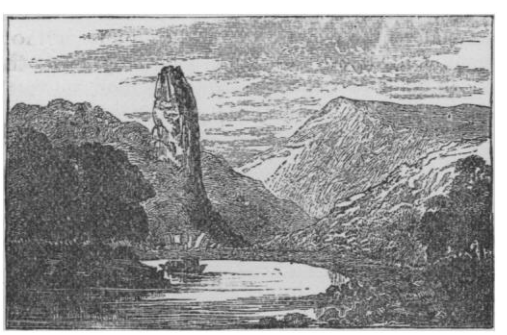
Mounting an elephant is no easy matter for a European. A native, with his bare feet and lithe body, just takes hold of the ear of the monster, and scrambles up; but we, with our boots and tight-fitting clothes, in vain attempt to follow their example. The hide is so slippery that we can get no purchase on it, and either have to be half lugged and half bundled up; or clamber from a stage on to the beast's head, and perhaps sprawl over the mahout as we attempt to enter the howdah; or else endeavor to mount by a rope-ladder, whilst the timorous elephant, unused to us and our strange appearance, is edging away, and may, in his fright, floor us with a swing of his trunk, and endeavor to make an end of us with his tusks.

I do not know whether any one before me ever attempted to make a route-survey from the back of an elephant: the difficulty of the proceeding can only be conceived by one who has tried it, particularly if the animal is a tall, long-striding brute. Female elephants are much pleasanter to ride than male ones; but, as a male elephant is considered superior, the natives insisted that I, being the head of a party that they wished to honor, should invariably mount the largest male tusker that they were possessed of. The weariness caused by the constant jolting that I suffered for months, joined with the constant wakefulness of my attention, left me nearly prostrate on my arrival at Bangkok.

Our first march was a short one. The elephants, after being unloaded, had their front feet shackled with anklets made of twisted cane, and were led away to their bath, and afterwards turned into the jungle to feed. The elephants had to be bathed and loaded by daylight, so that we might make long marches, and have a good rest in the heat of the day, when we took our breakfast. Before starting, we generally had some Kopp's soup mixed with Liebig's essence of meat, and some biscuits, with coffee, cocoa, or tea. Our breakfast, which we generally took about noon, consisted of soup, chickens, sometimes a duck, curry and rice, and vegetables when we could get them. Tea was always going, both for ourselves and our servants. At times we were so tired of fowls that we purchased cattle and had them slaughtered, as we could not otherwise get a beefsteak. Pork, even from wild boar, was dangerous food. Nearly all the people of a village we passed through in the Muang Fang plain were suffering from trichinosis, and most of the inhabitants in Viang Pa Pow had been taken ill about two years previously.

Our dinners were similar to our breakfasts, with the addition of fried plantains, tapioca, or boiled rice and jam.

Although deer were plentiful throughout the country, we seldom had venison, as we had no time to hunt. Often deer crossed our path right in front of our elephants, a wild boar would rush through our encampment, and jungle-fowl, quail, and hares be



PILLAR ROCK IN THE MEH PING.

met with in our day's ride. Gibbons were nearly the only monkeys that we ever saw, but they were very numerous in the evergreen forests.

Not only were fires lit for our dinners, but owing to the numerous tigers, which were constantly on the prowl at night in the neighborhood of our camps, often a dozen were kept burning all night long by

the Karens, who had charge of the elephants from Hlineboay to Muang Haut. The Shan drivers, who accompanied us on our other journeys, were not so fearful. We sometimes heard of tigers attacking oxen in villages on both sides of our camp, but we were so fortunate as to see no more of them than their footprints.

Our encampments were generally under the shelter of large evergreen-trees, at times upwards of twenty-four feet in girth, a hundred and fifty feet to the lowest branch, and from a hundred and eighty to two hundred feet in height. Our shelter, until we reached Zimmé, consisted of a frail structure formed of a few branches covered over with two waterproof sheets, slightly bent, so as to allow the heavy dew to drop off. Our howdahs, for this stage of our journey, were without covers: so we could not creep into them to escape from the storms that are frequent in the hills, even in the dry season.

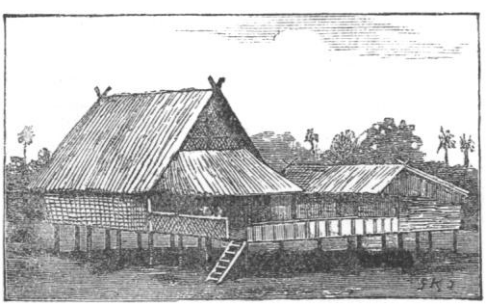
Mr. Colquhoun has noted, in his most interesting work 'Amongst the Shans,' that Shamanism, or Nat worship, is not only the sole religion of most of the hill-tribes in Indo-China, but has been absorbed into the worship of the followers of Buddha. 'Nat' is the Burmese for the elf-folk, fairies, gnomes, and demons of our nursery lore. So real is the worship — or, rather, the belief in the power — of these beings, that all good and evil that occurs to mankind is put down to their direct influence or action. Wherever one goes, little doll-houses are found placed on small platforms of bamboo, with a few leaves, fruit, rice, flowers, or perhaps all together deposited in them, to keep the Nat, or Pee, in good temper. Their baneful influence is more feared than tigers; and every precaution was taken at all our halting-places to propitiate, appease, and ward them off. Mystic crosses of bamboo were stuck up at the paths leading to the camp; and, on sauntering round, many traces were seen of devotion to the Pee.

One peculiarity of the good and evil Pee, is that they are ancestral spirits, who become good or evil spirits after the decease of the human form which they inhabited. If a king or other ruler or nobleman dies whilst passing through the forest, his spirit must, of necessity, haunt the place where he died. No merit-making can arise from procuring religious services over his corpse. The disembodied spirit wanders about in his desperation, and endeavors to cause the death of all who pass his way. If he succeeds, the deceased's spirit has to become his companion and subject. Thus a clan, with its chief, is formed to entrap and kill all unwary passengers through the forest. No one dying in the forest has the privilege of returning home to join the household spirits: they are forever destined to be Pee Pa, or evil spirits of the jungle. The Pee Ka are wizard spirits of horse form, who are re-enforced by the deaths of beggars and very poor people, whose spirits were so disgusted with those that refused them aid in food and shelter, that they resolved to return and haunt their stingy and hard-hearted neighbors.

Leaving the British guard-house on the 28th, we arrived the next day at the Shan guard-house at Meh Tha-wa, on the Thoungyeen River, which here forms the British eastern frontier.

We clambered over the hills and spurs in the usual crow-flight of the Karens, and, descending into the valley of the Meh Nium or Maingloongyee River, reached Maingloongyee on the 5th of February. Here we put up at the house of one of our largest Burmese foresters, called Moung Hmoon Taw, who has worked the forests in the basin of the Meh Nium for many years. Having procured a relay of elephants, I left the town on the 13th, and, crossing by a route to the south of that taken by previous travellers, reached Meh Lyt valley, and ascended the main range to the plateau upon which the Lu-a village of Baw-gyee is situated.

From Baw we descended the hills to Muang Haut, a town on the Meh Ping River, and, hiring boats, arrived at Zimmé on Feb. 23. The scenery on the Meh Ping is very beautiful. Between Zimmé and Muang Haut the river generally hugs and twirls about the spurs to the westward that spring from the haunches of a magnificent round-topped hill called Loi Pah Kung, or the Cloud-Capped Mountain. This hill



SHAN HOUSE AT KIANG HSEN.

dominates the whole range: its summit must be about ten thousand feet above the sea. Another striking feature is the Hill of the Tiger Head, called so from the resemblance the precipice that forms its eastern face bears to its godfather. The banks of the river for many miles below Zimmé are fringed with villages, the houses being embedded and often hidden in gardens of palm, cocoanut, mango, tamarind, orange, and other trees. Farther down stream the villages become less frequent, and are often screened from view by the plume-like bamboos that fringe the banks. The lights and shades on the foliage, and the deep, cave-like recesses between the clumps, together with their elegant and ever varying form, crested at times by the crimson blossoms of the lepan, poukbin, and pin-leh-ke-thit trees, gave the whole scene a charm that is passing description.

Leaving Zimmé, we passed for twelve miles through the cultivation and villages lying to the north of it; then, getting amongst the hills lying to the east of the Meh Ping valley, we descended a few days afterwards to Viang Pa Pow, which lies in the valley of the Meh Low, that empties into the Meh Kong or Cambodia River a few miles south of Kiang Hsen. We were now amongst the wizards and witches. The

Pee Ka, or horse-shaped spirits, that I have before alluded to, attach themselves sometimes to one, and at other times to another, of their descendants, who are supposed to have the power of using them as ministers of ill to their neighbors. The belief in these spirits is universal through the Shan state, and is the cause of a vast amount of cruelty and misery. A man falls ill; his malady baffles the skill of the physician; the spirit doctor is called in, and decides that it is a case of witchcraft. The doctor calls the officer of the village and a few others as witnesses. His first question to the invalid is, 'Whose spirit has bewitched you?' If no reply is given, the sick person is pinched, or beaten with a cane, until he makes the disclosure. The replies are put down to the witch-ghost, uttered through the mouth of his victim. Other questions are then asked; such as, 'How many buffaloes has he?' 'How many pigs?' 'How many chickens?' 'How much money?' The answers to these questions are written down by the scribe. A time is then appointed for meeting at the accused person's house. The same questions are put to him as to his possessions. If his answers agree with those of the sick person, he is condemned, and held responsible for the acts of his ghost. He is ordered to leave the village, has his house unroofed and pulled to pieces, and his garden trees cut down. Witches and wizards, who are thus driven with their families from their homes, are only allowed to resettle in certain places: amongst these are Muang Paow, Muang Ngai, Muang Pai, and Kiang Hsen. There was hardly a village of any size through which we passed that had not one or more houses unroofed, the people of the house having been ousted on this fearful charge. The Pa-pow plain is fast being brought under cultivation by these exiles: it is many miles in length, and of considerable breadth.

After leaving the plain, we continued along the route Capt. M'Leod took in 1836, as far as Kiang Hai. Here we had to stay a day or two to procure a relay of elephants. At Kiang Hai we met for the first time Moosurs, called so by the Shans, but La-Hoo by themselves. Their faces were of a decided oval, and their Turki aspect bespeaks them of similar type to the Mohammedans of Yunnan. The high position that is allowed to woman amongst the Indo-Chinese was evidenced throughout my journey. Their power and acknowledged rights are well exemplified by the law of divorce amongst the Moo-sur. These people are monogamists. Either can divorce the other at will, on payment to the divorced party of a sum of forty rupees. The woman takes the house, the daughters, two-thirds of the clothing, one-third of the money, and half of the goods. The sons, together with the remainder of the clothing, money, and goods, go to the man. From Ban Meh Kee, a village of two hundred and thirty houses, near the border, we turned eastward, and, passing the remains of the three ancient cities of Manola, proceeded to Kiang Hsen. The remains of the three cities of Manola, each about half a mile in diameter, consisted of a ditch dug round the bottom of knolls, and heaped up to form high parapets on either side. The top of the inner ramparts are about forty feet above the bottoms of the ditches, which are about a hundred feet wide. During my various journeys, I passed through, or not far from, and learned the names of, forty-eight such deserted cities. As some of these were upwards of two miles in width, the population of the country at one time must have been large. Many of these cities, however, may have been cities of refuge for the people of the districts in time of invasion, and only partly occupied in times of peace. The Kiang Hsen plain is perhaps the largest and most fertile in the Shan states. It extends for fully a hundred and fifty miles from north to south, and is often many miles in breadth. Teak grows luxuriantly upon the low hills in its neighborhood; and in the forests on the eastern side of the Meh Kong, there are said to be extensive tracts covered by it. The city of Kiang Hsen was re-occupied in 1881. Its former wealth and population must have been great; as there were fifty-three monasteries within its walls, and many very valuable bronze images of Buddha are scattered about the enclosure. We met large bodies of emigrants proceeding to Kiang Hsen during our



RUINS AT KIANG HSEN.

journey to Kiang Hai, and heard from the prince of the place that forty-eight hundred fighting men, with their families and slaves, had been told off from Zimmé, Lakhon, Lapoon or Labong, and Peh, to settle in the plain about Kiang Hsen. Most of these are the descendants of the captives who were removed after its surrender in 1797. Returning to Kiang Hai, we followed the Kiang Hsen plain from the basin of the Meh Low into that of the Meh Ing, and reached the town of Penyow, where small-pox was raging. Here we were detained for some days, waiting for elephants. Leaving the town on the 28th of April, we crossed into the valley of the Meh Ngow, and thence into that of the Meh Wung, on which the important town of Lakhon, which contains about ten thousand inhabitants, is situated. Crossing the hills to Lapoon, we arrived at Zimmé on the 20th of April, six days after the commencement of the rains. My companions and all of our servants were suffering from fever towards the latter end of the journey, and I was glad to get them all safely back into Zimmé on the 24th of May. After stopping a week in the town, I left for Bangkok.

THE LAST CRUISE OF THE ALBATROSS.

The U. S. fish-commission steamer Albatross, arrived at Wood's Holl, Mass., July 16, from her first cruise to the important fishing-banks located off the coasts of the maritime provinces, where she had been making extensive investigations in the interests of the cod and halibut fisheries for about a month. Most attention was paid to the region of the Grand bank, south of Newfoundland, including its northern, western, and southern slopes, and the adjacent waters of Green's and St. Peter's banks. Thence the explorations were continued across Banquereau and Misaine bank, and as far to the westward as LeHave bank. On the homeward passage, a few observations were made along the outer slope of George's bank. Over a hundred hauls were made with the beam-trawl and dredge, and much hand-line fishing was done. An attempt was also made to obtain specimens from the bottom by means of torpedoes exploded in a depth of about forty-five fathoms; but without success, only two or three cod and haddock coming to the surface. These experiments clearly proved that only such fish as possess large swim-bladders are likely to float after having been killed at the bottom in this manner.

The results obtained on this cruise are of great value, and an exceedingly large number of specimens serving to explain the character and resources of the fishing-grounds was secured. These explorations are, in fact, the first of the kind that have been made of the outer banks to the eastward of the meridian of Halifax; and they furnish us with the first connected series of observations that has been obtained regarding one of the most important fishing-regions of the world. They are also of especial interest at this time, in view of the probable re-opening of fishery negotiations between the United States and Canada. Almost the only previous information we possessed respecting the fauna of the great banks was secured through the agency of the Gloucester fishermen, whose services to the Fish commission since 1878 have already been made known.

The cruise of the Albatross, just ended, is to be regarded as scarcely more than a preliminary one, since there are many important problems bearing upon the distribution and migrations of food-fishes over the great banks, which invite a prolonged series of careful investigations according to modern methods of research. It was noticed, that, on some portions of the Grand bank, where good fares were being obtained by the fishing-vessels, the bottom was comparatively barren of life; leading to the conclusion, that, over some areas, the fish must feed mainly upon free-swimming animals above the bottom, and that the true value of a fishing-ground cannot always be determined by means of the dredge.

As incidental features of the cruise, careful sounding observations were made at the reported locations of Hope bank, Watson's rock, and the Jesse Ryder rock, without finding any traces of their existence. Many icebergs were observed south of the Newfoundland coast, and foggy weather frequently interfered with operations.

Lieut.-Commander Z. L. Tanner, U.S.N., was in command of the Albatross, with Capt. J. W. Collins in charge of the practical fishery investigations, and Mr. James E. Benedict as chief naturalist, assisted by Mr. Sanderson Smith, Mr. Willard Nye, jun., and Mr. Thomas Lee.

REFORM IN GEOGRAPHICAL ORTHOGRAPHY.

THE absence of system in geographical orthography, especially in English maps, and the consequent confusion and variety that exist in the spelling of foreign names on such maps, have necessarily attracted the attention of cartographers of every country. The council of the Royal geographical society has taken the matter up, and proposes what seems to us, on the whole, a very satisfactory set of rules, which will hereafter be used in all the publications of the society. These are in brief as follows: Names of countries in which the Roman alphabet is used will be spelled as by the respective nations. Names familiar in a certain form (ex., Calcutta, Celebes, Mecca) in English literature will be retained unchanged. The true sound of the word, so far as it can be indicated by the system as pronounced by the local population, will be reproduced as the basis of the spelling. In general, the vowels will be pronounced as in Italian, and the consonants as in English. Only one accent, the acute, to denote stress, will be used. Every letter is pronounced. To shorten the vowel, the consonant following it is doubled (ex., duty, putty). The spelling of Hunter's Monumental gazetteer of British India will be followed for Indian names within its limits.

These rules are essentially such as have governed American philologists under the lead of George Gibbs for many years, and, while not equal to the refinements of the lexicographer, are abundant for daily needs. Those who use maps cannot be bothered by minute shades of difference in pronunciation, which can only be properly studied on the spot where they exist.

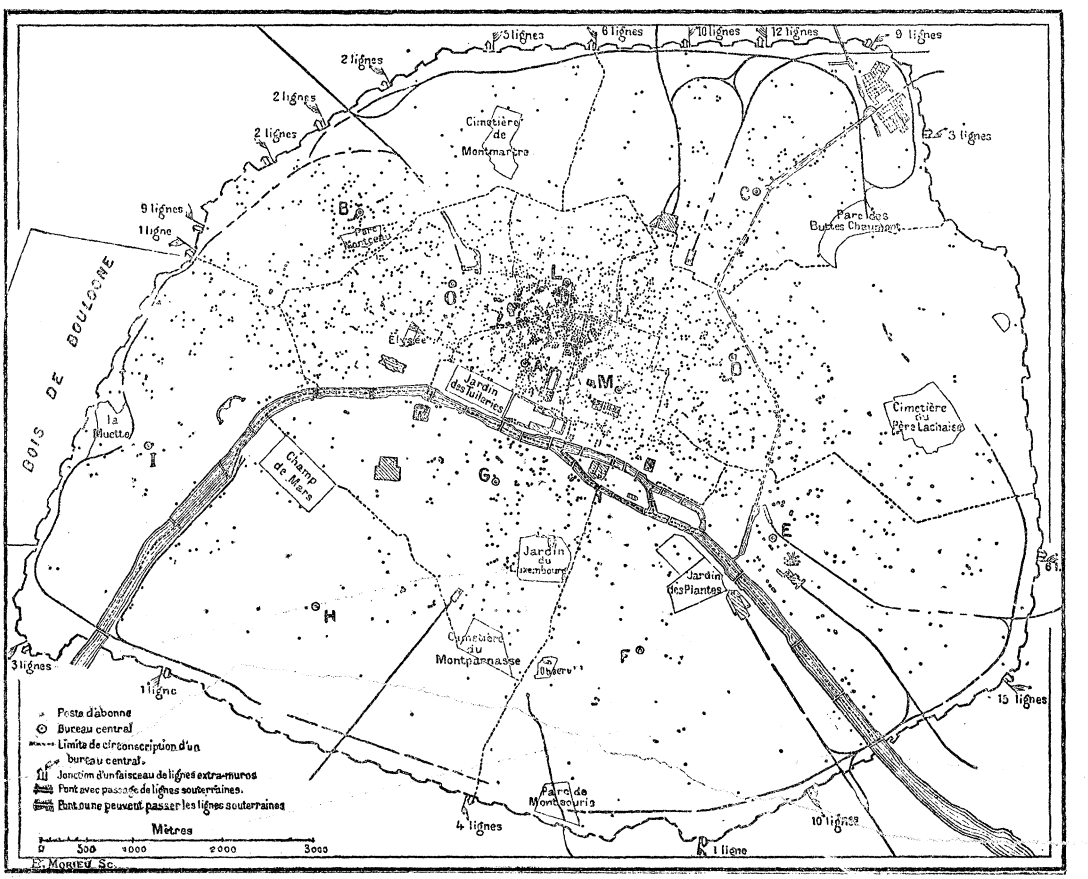
It will be observed that the treatment is far from radical, and eminently practical: the only wonder is, that it has been so long deferred. The time for an international alphabet for map use, whose letters shall have invariable values, which would be the most satisfactory solution, is likely to be long deferred on account of certain obvious though unscientific objections. The proposal now made is in the right direction, and its principles have to a large extent been adopted already on the admiralty charts, and by leading geographers of various nations.

THE TELEPHONE IN PARIS.

WE reproduce from *La nature* a map showing the distribution of telephone subscribers in Paris. This map gives all the offices of the subscribers, represent-

ed by dots: it shows the central bureaus, A, B, C, D, E, F, G, H, etc., and gives other information as indicated in the legend.

The telephone system of Paris is, after that of America, one of the most prosperous, numbering at the end of last April thirty-eight hundred subscribers, very unequally distributed over Paris and the suburbs, as is easily seen from the map which shows their distribution Oct. 1, 1884, with the points of attachment of the lines outside of the city walls starting from each of the gates. In the Opera and



MAP OF PARIS, SHOWING THE DISTRIBUTION OF TELEPHONES (*La nature*).

Sentier districts, the subscribers are most abundant. There are a dozen district offices so distributed as to insure the service with the minimum of conductors; the system being, as is known, almost entirely subterranean. Between each of these twelve offices, and the eleven others, there are auxiliary lines sufficient to establish communications between the subscribers, by passing through two district offices at the most, whatever be the distance between the subscribers. The number of these auxiliary lines naturally varies with that of the subscribers connected with each district office.

PROFESSOR SUMNER'S ECONOMIC ESSAYS.

"ONE may read, in scores of books and articles, that political economy is passing through a transition stage. . . . It is certainly true that there is no body of economists engaged in carrying on the science of political economy by a consistent development of its older results, according to such new light as can be brought to bear upon them. . . . A host of writers have been busy for the last twenty years, introducing conflicting and baseless notions, which, for want of a competent criticism, have won standing in the science. Others have made a boast of turning their backs on scientific method, and of describing, by way of contributing to political economy, some portion of the surface appearance which is presented by

Collected essays in political and social science. By WILLIAM GRAHAM SUMNER. New York, *Holt*, 1885.

the mass of economic phenomena in their sequence, variety, and complexity. That is as if a historian should boast of abandoning the attempt to trace social forces in history, and of returning to the description of royal marriages and diplomatic intrigues."

Professor Sumner thus describes, in the opening sentences of the second essay in the volume before us, the present condition of economic science. That such a description should be in the main a true one is deplorable; and Professor Sumner is deserving of all commendation for his stanch loyalty to well-established economic doctrines, and to the cause of scientific method as against empiricism in economic research. But if the world has been going astray in recent years, we do not believe it has been solely because we are a stiff-necked generation. Much has doubtless been due to the sins of the time; but much, too, can be traced to the shortcomings of those who maintain the true doctrine. Probably nothing has done more to discredit the authority of economists of the English school than the wide-spread opinion that they decide every question of political economy, however complicated, by an offhand application of a few simple principles. And it does indeed belong to the intrinsic character of their investigations that a few leading principles are kept constantly in view, and that questions which would otherwise be involved in hopeless confusion are thus made amenable to orderly and systematic and frequently successful treatment. Too many writers, not without standing and authority, not without learning and penetration, have, however, gone farther, and fallen into the way of cutting the knot of every intricate problem by a single sharp and decisive blow of the sword, — by an appeal to the magical force of a great economic law. They have thus given the objectors to the science of Ricardo and Mill a real and important ground for their criticism

Unfortunately, Professor Sumner too often places himself in the ranks of the writers we have just been describing. In the volume before us there are three economic essays, — on bimetallism, on wages, and on the argument against protective taxes. In the first and third, there is before the writer a distinct fallacy to refute, a distinct outrage upon economic doctrine to resent; and it is in such a situation that there is the strongest tendency to crush an opponent by a single blow, to sweep away all argument by a single appeal to an all-comprehending principle. Accordingly, we find that Professor Sumner's argument against the possibility of a concurrent circulation of gold and silver may be summed up in the mere *dictum*, that, since supply and demand regulate value, all the governments in the world could not make silver and gold circulate together; and his argument against the belief that protective taxes may in some cases contribute to the general prosperity is little more than the bald statement that restraints upon commerce introduce no new productive power, and hence cannot increase the aggregate production, while, as every tax and every restraint involves waste and loss, there is sure to be a diminution in the aggregate production, and a fall in the general prosperity.

Considerations such as these are very good as far as they go, and are indeed of the highest importance. They give a *prima-facie* reason for believing that those who expect economic advantage to arise from protection, or who think it possible to make gold and silver circulate side by side as prime mediums of exchange, are mistaken. One may say more: it needs but a brief and clear exposition of general principles to take the ground from under the feet of all the ordinary advocates, on the stump or in the newspapers, of protective taxes or bimetallic currency; or, rather, to show that such advocates, ignorant of the first principles of political economy, and heedless of the simplest requirements of sound reasoning, had no ground to stand upon. But there are men who know something about political economy, and still think that an agreement of all the commercial nations of the world could keep silver circulating alongside of gold at a constant ratio: they have heard of supply and demand, and have some understanding of its working; they know, as well as Professor Sumner does, that congress cannot, that all the governments of the earth cannot, enforce a fiat that a pound of meat shall have the same value as a pound of sugar; they know also, however, that the demand for the precious metals comes in a very great measure from their use as coins, and that their use as coins is in a great measure affected by the more or less arbitrary action of governments. It behooves an economist, under these circumstances, to point out, if he can, that the influence of governmental action upon the demand for gold and silver has such bounds, that variations in the supply might occur — or must occur — sufficient to overbalance that influence. Professor Sumner contents himself with repeating, in every variety of expression, the assertion that government cannot confer upon any thing a higher value than that which is determined by demand and supply.

"Congress cannot regulate the value of money until it can make a man give for a gold dollar one grain of wheat more than supply and demand force him to give, or yield a gold dollar for one grain less than supply and demand will give him for it. . . . It cannot regulate the value of a coin, any more than it can regulate a physical object to make it longer or shorter than it is. . . . To secure a concurrent circulation, then, at a fixed ratio, it is necessary to suppress the effects, which can only be done by suppressing the forces; so that a concurrent circulation could never be realized until we could extinguish economic forces by human agency." Now, all this might be well enough by way of reply to one who was ignorant of the existence of 'economic forces' and the rest; but of what avail is it as against a man whose mind is troubled by the fact that governmental action is itself, in the matter of currency, one of the most constant and apparently important of these 'economic forces'? Intelligent doubters and honest opponents can be but little influenced by the levelling of economic anathemas at them: they can only be won over by a fair statement of the strongest arguments that can be urged on the other side, and a refutation of them.

Similar objections apply with equal force to Professor Sumner's treatment of the subject of protection. It is of immense advantage to correct thinking on the subject, that one should see, first of all, clearly and unmistakably, that a protective tariff is a tax on production; that its immediate effect is to diminish production, to reduce the returns to labor and capital, to lessen the rewards of human effort. The demonstration of this important though simple truth at once clears the air of the mists and vapors with which it may have been filled by popular ignorance and misconception. But when it is urged by clear and candid thinkers that there may be cases in which, even upon purely economic grounds, it may be worth while to incur this loss for the sake of a future gain made possible by it, it is useless to dogmatically shut off discussion by simply saying that protection is an economic loss, and nothing but economic loss can come of it. There is not the least disregard of the principles of political economy in supposing that an industry which it would not pay to introduce in a given country, without government protection, might be a profitable and independent one after it was introduced. Lack of knowledge, national habits, the prestige of foreign manufacturers, — such are some of the causes which may prevent the rise in a given country of an industry for the pursuit of which its natural advantages may be exceptionally great; and it is simply impossible to 'demonstrate' that an industry may not thus be established a century sooner than it would otherwise be, and which, in all but its first years, would be a source of increased prosperity to all classes of the people. There are a thousand valid objections to protection even in this case, but it is not an economic absurdity. To say, as Professor Sumner does, that "it is mathematically impossible that it [a protective tariff] should ever issue in an independent and productive industry," is to vastly diminish, in the mind of an intelligent reader, the force of those conclusions whose truth has really been demonstrated.

Ungracious as it may seem, we have yet to draw attention to a special feature in the style and method of Professor Sumner's argument which is calculated to intensify the impression of dogmatism and reckless generalization which economic writing of this character so often produces. This is his constant employment of language borrowed from mechanics or physics, and especially his frequent appeals to the principle of the conservation of energy. Amateurs in natural science have shown, in the last decade or two, a very great fondness for this principle, and have delighted in exhibiting the facility with which, by its aid, they could solve the problem of the universe, or any smaller problem which might happen to engage their attention. But responsible writers on political economy — or, for that matter, on any other subject — will do well to leave the principle of the conservation of energy to play its proper part in its proper field. Some writers might be surprised to find how necessary it is even in that field, to use it in the exact sense in which it is understood by mathematical physicists; how little it enables one to do easy, offhand work, and accomplish the immediate despatch of all scientific business. One regrets to see even so much as the *term* used in discussions that are outside the domain of physics, for fear that the vagueness which must necessarily there attach to the term may affect the reasoning in which it appears; this, however, may in some sense be regarded as a matter of taste. But to use the principle of the conservation of energy by way of *argument* in economic discussion is utterly unjustifiable; and when a writer says that "to suppose the contrary" of an economic proposition, "is to deny the most obvious application of the conservation of energy to economic forces," he can but make the judicious grieve. The acme,

however, of this kind of writing and thinking, is reached by Professor Sumner, when, in one of the non-economical articles (p. 134), he gravely tells us, speaking of elections, that "they are not a source of energy, and therefore cannot cause any thing at all."

We have dwelt thus at length upon these faults, because we consider them as most hurtful to the cause of sound discussion, and to the influence of the very methods in political economy which, with Professor Sumner, we wish to see upheld. We have not attempted to give a full account, or, if one prefers the expression, a fair account, of the papers collected in this volume. In the article on wages, and even in those on bimetallism and on protection, there are instructive passages and telling points. The articles are not made up entirely of impatient assertion and sweeping denunciation. In the discussion of bimetallism, valid practical reasons are adduced against it, and the same is true with regard to protection; but it is precisely the theoretical core of the argument which is made weak and powerless by the defects which we have endeavored to point out.

SCIENTIFIC CULTURE.

THE question of the position of the physical sciences in courses of instruction, as compared to that of the classics, was scarcely thought of at the time when Professor Cooke began his work as an instructor in the experimental sciences thirty years ago. During this long service as a teacher and investigator, the question became a glowing one, but has been so far settled as to give to many of the essays of the little volume before us an historical rather than a current interest.

Nevertheless, the general reader who may care nothing for the Greek question will read these essays with pleasure. He will admire the earnestness and candor of the writer. He will follow with delight the limpid stream of argument and exposition. To the citation drawn from the literature of physics, to the effect that "such men as Davy, Dalton, and Faraday were as truly learned, as highly cultivated, and as capable of expressing their thoughts in appropriate language as the most eminent of their literary compeers," might be added the name of the author.

The most important statements which are made in these essays are quite independent of the subject-title. They should be printed after the manner of certain biblical texts, and displayed on the walls of every collegiate hall in the land.

We append a few of these paragraphs: —

"There is no nobler service than the life of a true teacher; but the mere taskmaster has no right to the teacher's name, and can never attain the teacher's reward" (p. 85).

"The teaching which a professorship implies, instead of being a hindrance, ought to be a great stimulus, to scientific investigation. Of course, this influence is greatly impaired, if, as in many of our colleges, the available energies of the teacher are exhausted by the daily routine of instruction, or by outside work required to supplement his meagre salary; but if the teaching is only moderate in amount, and in the direction of the professor's own work, there is no stimulus so great as that which the association with a class of earnest students supplies" (p. 280).

"Men of affairs should resign the endowments intended for the maintenance of scholars to those whose zeal is sufficient to induce them to make gladly the sacrifices which the advancement of knowledge usually entails" (p. 277).

Scientific culture and other essays. By JOSIAH PARSONS COOKE, LL.D., professor of chemistry and mineralogy ir Harvard college. Second edition, with additions. New York, *D. Appleton & Co.*, 1885.

AROUND AFRICA.

THE activity which the Germans have shown during the past few years in colonial and commercial enterprises has produced some good results, and has given occasion for a few good books, notably those of Schweinfurth and Nachtigal. Dr. Joest, instead of following those explorers into equatorial Africa, circumnavigated the Dark Continent, visiting only a few inland towns in the extreme south-east. He described his travels in a series of letters to the Cologne *Zeitung*, which form the basis of the present work. Schweinfurth and Nachtigal performed their tasks well, and gave us good common-sense accounts of the people they visited, and the countries they saw. So has Dr. Joest. His first stopping-places were Madeira and St. Helena, which have been so often described that he was able to add little of interest. From St. Helena he went to Capetown, or Kapstadt, as he in true German fashion insists upon calling it. And this is a good place to utter a protest against the habit which the Germans have of translating proper names; for, really, 'Kapstadt,' 'Tafelbai,' and 'Kapland' do not represent the places described. Indeed, either this fact seems to have struck

Um Afrika. Von WILHELM JOEST. Mit 14 lichtdrucken und zahlreichen illustrationen. Köln, 1885. 8°.

our author, or a longer sojourn among English-speaking people (he was obliged to travel almost entirely on English steamers) may have made the English words less displeasing to him; for further on he writes of Port Elizabeth and Steamer Point without any compunctions. From Port Elizabeth he travelled inland to Kimberly, and Orange Free State, reaching the coast again at East London; thence to Port Natal, where he again left the coast, and proceeded to Durban and Zululand. He writes Zulu, Zambesi, and Zanzibar, 'Sulu,' 'Sambesi,' and 'Sansibar,' on the ground that *s* represents the sound better than *z*. So, too, he spells Cetewayo, 'Ketschwayo,' and



NATAL CAFFRE.



SULU MAIDEN.

probably is right in all four cases. Returning to Port Natal, he once more took steamer, and, after touching at ten or eleven places, returned home *via* Aden and the Suez Canal. He visited neither Angra Pequena nor any other port on the coast now claimed by Germany in south-western Africa, nor Madagascar, concerning which there is need of fresh and reliable information. With these exceptions, he did all that could be expected of him; and we know of no better account of the growth, economic conditions, and ethnographic relations of the countries visited. Some allowance, of course, must be made for his sympathy with the boers as against England; but, making such allowances, his account of the English South-African colonies is sufficiently full and accurate for the general reader.

The illustrations are a feature of the work. But while the full-page *lichtdrucken* ('heliotypes') are excellent, a few smaller portraits of negro men and women have much more interest for the student of African ethnology. Indeed, Africa should be visited by a good photographer, — one who would be willing to devote a portion of his energies to taking pictures of individuals, and not, as has generally been the case, confine himself to groups of badly scared natives artistically arranged in rather suspicious-looking 'market-places,' 'main streets,' and the like. The volume is further illustrated by a very good map — as maps of Africa go — from the establishment of Justus Perthes, showing our author's route, and the portions of the coast-line claimed by the English, French, Spaniards, Portuguese, and Germans. One noticeable feature is that the Welle of Schweinfurth is given as probably identical with Stanley's Aruwimi, which would seem to be a rather premature statement. Then, too, the courses of rivers are laid down altogether too positively. Still, one should not quarrel with this map on that account, as it is a failing of nearly all maps of Africa, and, indeed, of maps of all partially explored countries.

NOTES AND NEWS.

THE local committee of the American association has issued its second circular containing the general programme of the meeting at Ann Arbor. The meeting will be called to order on Wednesday, Aug. 26, at 10 A.M., when Professor Lesley will resign the chair to President-elect Professor Newton of New Haven, and the usual addresses of welcome will be delivered. In the evening Professor Lesley will give his presidential address. On Thursday evening the citizens of Ann Arbor will tender a reception at the court house, and on Friday it is probable that a lawn party will be given on the university grounds. On Saturday a long excursion, as previously announced, will take place; on Monday a short excursion for the members of the botanical club has been planned, probably to the Tamarack swamp, one of the detached spots common in Southern Michigan, where a northern flora has lingered under favorable conditions through the various climatic changes of later geologic times. It is probable that similar trips to points of local interest may be arranged for some of the sections. It may be well to call the attention of botanists to the fact, that, while at Ann Arbor, they are within a few hours' ride of one of the remaining tracks of pine which represents all that is left of one of the formerly most magnificent pine-forests of the continent. The chairman of section C announces that the following subjects have been chosen for discussion: first, what is the best initiatory course of work for students entering upon laboratory practice? second, to what extent is a knowledge of molecular physics necessary for one who would teach theoretical chemistry? In the discussion in section D, mechanical science, of the best method of teaching mechanical engineering, in order that what is read and said may be to the point, the following classification should be observed: (*a*) schools of mechanical engineering; (*b*) mechanic arts schools for the education of superintendents, foremen, etc; (*c*) manual training-schools. The distinction between 'mechanical laboratory practice' and 'shop practice' should also be made and appreciated. The officers of the Michigan central, and of the Toledo, Ann Arbor, and Northern Michigan railroads, have agreed that all persons attending the Ann Arbor meeting may receive return tickets to their homes over the roads by which they may have come on presenting a receipt for their fare, from the ticket-agent at their home, and a certificate from the local secretary that they have been in attendance upon the meeting. Those who expect to avail themselves of the special train from Buffalo should immediately notify the secretary, as not enough have as yet signified their intention of going in the train to justify its running.

— We have all heard much of the famous Solenhofen Archaeopteryx, and of the toothed birds of America, and have doubtless understood in a general way that they cleared up much of the obscure geological pedigree of birds. We are indebted to Professor Wiedersheim for two excellent articles, summaries of the history and significance of these discoveries. These essays are to be found, one in vol. iii. of the *Biologisches centralblatt*, and the other in *Humboldt* for June, 1885. The latter is the less technical, and has the advantage of being illustrated, and is indeed a very admirable popular article. As the new Darwin memorial has recalled attention to the early struggle of evolution against prejudice, it is interesting to think how opportunely the first discovery (1860) of the fossil link, Archaeopteryx, between birds and reptiles, came to support the Darwinians. It awoke a storm of discussion, and there was no little indignation in Germany when the specimen was allowed to leave Solenhofen for the British museum. It was sold for thirty-five hundred dollars to the English. Altogether Archaeopteryx has probably occasioned more human emotions than any other known fossil. The second specimen of Archaeopteryx was more perfect, and was finally sold to the Berlin museum for twenty thousand marks. This specimen has been recently described by Professor Dames, the first having been monographed by the venerable Richard Owen. Wiedersheim does not accept all of Dames's conclusions, but gives at the end of his second article his own views as to the evolution of birds. He thinks the class had a double origin, there being two divergent lines from some as yet undetermined reptilian ancestor. One line led through the dinosaurians to the ancestor of Marsh's Hesperornis and the running-birds (Ratitae): the other line began with long-tailed saurians, from which sprung, on the one hand, the flying saurians; on the other, the line of development leading to Archaeopteryx, then, further, to Marsh's Ichthyornis, the ancestor of the flying birds (Carinatae). Whether this theory of the double origin of birds will hold, may be fairly questioned; but, at the same time, the theory cannot be summarily dismissed. It does not yet appear that the theory will satisfactorily account for the *common avian* characteristics of the two great sub-classes of birds, since the divergence, it supposes, began between reptilian ancestors.

— In consequence of prolonged researches on the absorption and assimilation of peptone, Dr. F. Hofmeister has arrived at some very interesting results. If peptone and other nutrients are introduced directly into the blood, even in small quantities, they are expelled through the secreting organs, whilst on the reception of much larger quantities of the same substances by way of the intestine, under physiological conditions, nothing similar is observed. From these phenomena, Hofmeister concludes that the absorption of peptone in the intestine is no simple mechanical process of filtration or diffusion, but a function of definite living cells, — the colorless blood-corpuscles. Certain substances are no doubt carried about in the extra-cellular fluid; and whether they are absorbed by the tissues, or lost, depends upon chance alone. It is not so in the case of 'cellular transportation;' for, if the substances are enclosed in the cell-walls, they are not subject to the laws of diffusion, and are not used up until they reach the tissues which have an affinity for them. If the cells are moved about by the currents in the blood, they reach the tissues by

chance; but, if they have an automatic motion, they are in a degree independent of the air-current, and can direct their own course. The amoeboid movements of the cells may have some connection with the presence of an excess of nutrient matters for distribution.

— Herr Hilt of the Prussian fire-damp commission says, as the outcome of a long series of practical experiments on the very fine coal-dust of Pluto mine in Westphalia, that "there can be no doubt, that, with this kind of dust, the flame could be lengthened out to any desired length, provided the gallery and layer of dust on its floor were made equally long." Differences in chemical composition do not appear to have so much effect in controlling the length of flame produced by a given dust as the comparative fineness of the particles. The French commission finally pronounced that coal-dust is an element of very secondary importance; but the Prussian commission, partly from the large scale upon which it worked, and partly from the natural fineness of the dust upon which it experimented, has arrived at the opposite conclusion. One of the most violent explosions on record recently occurred in the Camphausen colliery; and it is generally admitted that coal-dust, not fire-damp, was the principal cause of destruction.

— It is generally admitted that the most effective arrangement of a course of instruction in qualitative analysis includes a brief study of the more important compounds of the elements composing the group, as regards their solubility, followed by a method of analysis, this plan being applicable both to basic and acid analysis. The acids may be classified with nearly the same precision as the bases, so that the presence or absence of a group containing half a dozen acids can be shown by means of a single reagent. The 'Treatise on practical chemistry and qualitative inorganic analysis,' by Frank Clowes (Philadelphia, *Lea brothers & Co.*, 1885), follows the above plan in general, except in the arrangement of the acids. It adheres to the use of tables, which may be regarded of questionable utility unless the student is required to prepare them for himself. The selection of reliable tests and methods is, for the most part, all that could be desired. Much useful information is given concerning laboratory arrangements, apparatus, preparation-work, and chemical operations in general, which will doubtless be serviceable to many teachers, especially the hints on laboratory construction, and the directions for preparing reagents and substances for analysis. In fact, from its scope and general arrangement, the work seems better adapted for the use of teachers and advanced students than for an introductory text-book on qualitative analysis.

— In *Symon's meteorological magazine* (April, 1885) the old idea of having a floating mid-Atlantic meteorological observatory is once more urged. As most of the changes in British weather are due to the passage of storms from the west to the east, the only practicable way of forecasting these storms is by some such station, in about latitude 50° north, and longitude 20° west. The depth of the water at this point is about two thousand fathoms (two miles and a quarter); and a mooring-chain of that length would be a decided novelty, but not an impossibility, for the cable-laying steamship Faraday once found herself in the course of a cyclone which passed by without causing her to loose her hold of the cable. To lessen the expense, which might otherwise interfere with the project, the vessel could also be used as a call-station for passing vessels and for those in distress.

— We reproduce from *Science et nature* a picture of the statue of Claude Bernard, the eminent French physiologist, which has just been erected before the Collége de France. It was executed by Guillaume of



the French institute, and, on the occasion of its unveiling, was accompanied by a eulogy by Béclard, the dean of the faculty of medicine of Paris, a portion of which is reproduced in *Science et nature* of June 6.

— N. de Miklouho-Maclay tells us (*Proc. Linn. soc. N. S. Wales*, ix. 963), that during the years 1871 and 1872 no less than thirteen earthquake shocks were felt on the Maclay coast of New Guinea. Upon his return to that region in 1876, the mountain peaks which in 1872 were covered with vegetation were in places quite denuded, and portions of the coast devastated by tidal waves. There were crevices from one to three feet wide, and three or four feet deep; and the depth of the sea was in some places appreciably altered. Since 1876 there have been only slight shocks, which have occurred at the same time as

eruptions in the various volcanoes on the island. In addition to the slight changes accompanying the frequent earthquakes, there are evidences of a recent extensive rising of the whole coast. In hills of a greenish sandy clay, there are layers of the remains of marine animals now inhabiting the shallow waters. These layers are at various heights, from one hundred to four hundred feet above sea-level. Another proof that the coast is still rising is the existence of numerous reefs of dead corals, which are left quite dry at each low tide.

— Dr. J. J. Weyrauch of Stuttgart has published (Leipzig, *Teubner*) a lecture on the history of the conservation of energy, which he delivered at Stuttgart in March of this year. In a series of appendices he has brought together a large number of references to the literature of the subject.

— The British steamship Venetian, Capt. Traut, reports that on July 16, in 43° 08′ north, 51° 25′ west, they sighted a very large iceberg two hundred feet out of water, five hundred feet long, and four hundred feet wide. As it was very clear at the time, and the vessel to windward of the berg (wind moderate from the southward), Capt. Traut experimented with the thermometer, to see if the ice had any influence on the temperature of the water. To his surprise, he found that there was no appreciable difference, the thermometer standing at about 57° for several miles on either side of the berg and close to it. He steamed alongside the berg, about eight hundred feet from it, and still the temperature remained the same.

— Miss Alice Lamb, a student of Professor Holden's at the Washburn observatory, publishes in the July number of the *Sidereal messenger* a critical discussion of the Willets Point latitude observations, which appear to show a decrease in the latitude of that place during the last five years. By selecting the best-determined stars, and by rejecting the observations with one of the instruments, and the work of some observers whose probable errors are about twice as large as the probable errors of those whose work is retained, she concludes that "there is perhaps strong reason to attribute the systematic change of latitude" to errors of observation, as Gen. Abbot has suggested.

— According to a paper read by Herr Mohr before the Magdeburg district association of the society of German engineers, the deepest bore-hole in existence is that bored for coal, near the village of Schladebach, on the railway between Corbetha and Leipzig. The total depth of this bore-hole, which has been driven with a hollow diamond-pointed rock-drill and water flushing, is 4,559 feet. Its diameter at the bottom is 1.872 inches, and at the surface 11 inches. Boring operations have been carried on for three years and a half, and a sum of $25,000 has been spent in reaching the depth attained. The temperature in the lower portion of the bore-hole was found to be 48° C., equal to 118.4° F.

— In Lord Aberdare's address at the annual meeting of the Royal geographical society of London already referred to, he stated that the continuous prosecution of marine surveys in different quarters of the globe had been well maintained during the past year. The two home surveying vessels have been employed, one on the west, and the other on the east, coast of Great Britain. On foreign surveys, sixty officers and five hundred men have been employed in four steamships of war and five other smaller vessels. These ships have been at work in Newfoundland, the Bahama Islands, Magellan Straits, South Africa, Red Sea, Malay Peninsula, coasts of China and Corea, northwest coast of Australia, and amongst the Pacific Islands. The most important additions to our hydrographical knowledge are as follows: The survey of the Little Bahama Bank will be shortly finished, and the same may be said of the southern shore of Newfoundland. The survey of the main strait of Magellan, to which reference was made in the last address, was completed early in the year. Many useful additions have been made to ports and salient parts of the coast of south-east Africa. In the Red Sea the intricate approaches to Suakin have been well laid down. On the west coast of the Malay Peninsula, Penang harbor has been resurveyed, and the positions of the islands lying to the north-west, and forming the eastern boundary of the ordinary route of vessels to Malacca Strait, have been accurately determined. The unknown western shores of Korea, south of the approach to Söul, for two degrees of latitude, have been explored, and the main features of this island-studded shore laid down. New rivers and harbors have been entered, notably the large river Yun-san-gang, at the entrance to which stands the considerable town of Mokfo. There appears, however, to be little chance of immediate trade with Korea, in consequence of the absence of any valuable products, and the scanty needs of the population. The southern approach to Haitan Strait on the Chinese coast, much used by British trade, has been recharted. On the difficult shores of western Australia such progress has been made as the small means at the disposal of the surveyors has permitted. In the Solomon Islands the Bougainville Strait has been charted. This channel will in future be most probably a highway for traffic between eastern Australia and Japan. Many additions have also been made to the charts of various groups of other Pacific islands. The survey of the coasts of India, carried on by officers of the Royal navy and India marine, has been actively progressing. Surveys of Rangoon, Cheduba, and other ports in the Bay of Bengal, as well as harbors on the west coast of Hindustan, have been made. A resurvey of the great Canadian lakes has been commenced in Georgian Bay.

— In Beloochistan, there are days when the air is so filled with sandy dust that the sun is obscured, and the particles of sand penetrate every thing. This is especially the case when there is no wind. The whirlwinds of sand are also common in this region. During a calm day, when not a breath of wind is felt, one can notice these columns rise and grow, and, beginning to rotate, travel forward across the country. They often attain considerable velocity, then decrease

and disappear. Sometimes several may be seen at the same time, each having a separate origin. The natives call them shaitans, or devils. Another very peculiar phenomenon in the same region is the sand-storm, which often occurs after several calm days, when the air is very warm and oppressive. The wind blows violently, sweeping the sand across the desert. Lightning and thunder and rain form a part of the storm, which often lasts several hours, then stops, leaving the air pure and clear. During the warm months the very hot and destructive wind called the simoom sweeps across the desert, destroying all vegetable life, and often killing men by its scorching breath. This wind is comparable with the sirocco of the Mediterranean, though much more destructive.

— An interesting account of Erythroxylon coca, and its history in Peru and in Europe, will be found in a small pamphlet by Dr. Sigm. Freud ('Ueber coca,' Wien, 1885, 26 p., 8°), together with an account of its action on animals and on a healthy man, and its therapeutic uses. He makes the noteworthy remark, that, while in North America preparations of coca are already much used, in Europe they are scarcely known to the majority of physicians, even by name. The greatest use of coca will probably always be that which the Peruvians have made of it for hundreds of years; viz., to enable them to bear arduous physical exertion for a short time without food or rest, as in war, in travelling, in the ascent of mountains, etc. For these purposes it seems to be preferable to alcohol. It has also been tried in digestive troubles, as an antidote for morphine habit, and as a substitute for alcohol, as well as for other purposes.

— The *Botanical gazette* for July devotes a large part of its space to the subject of bacteriology, including notes, comments, and book-reviews. It is a step in the right direction; for only by the publication of matter of this kind, and the increase of interest that will follow, can the study of bacteria be brought to its proper level in this country. This branch of investigation is constantly and rapidly growing in importance, and any attempt to diffuse a knowledge of what is going on among its students deserves the heartiest commendation.

— In a lecture delivered in the Khedival institute at Cairo, Dr. G. Schweinfurth has given some account of the seats of manufacture of prehistoric stone implements in the desert of eastern Egypt, discovered by him in 1876, 1877, and again visited and examined by him in his last journey. The two spots referred to are in the Wadi Sanur and Wadi Warag. The former lies due east of Beni Suef, at a distance of thirty miles from that town. The latter is in the upper portion of the Wadi, at the place where the water-course begins to be discernible as a longitudinal depression on the heights of the western part of northern Galala. Dr. Schweinfurth's belief that the two sites in question are really those of ancient manufactories of stone implements is grounded partly on the presence of accumulations of cores in the beds of the streams, partly on the fact that the raw material is found abundantly in the neighborhood. The source of the raw material is a bed of flints belonging to the upper nummulitic limestone corresponding to that which exists behind Cairo. Implements and utensils indicating a stone period have now, Dr. Schweinfurth remarks, been found, even in the very heart of Africa; and these show a surprising resemblance in form to those discovered in Europe. Those recently obtained by himself from Sanur and Warag, however, are of a special type; and Dr. Schweinfurth regards them as clearly distinguished from the forms already familiar, by the fact that the facets are usually only upon one side, and are very seldom seen surrounding the entire core.

— From a report of Mr. H. Walker, commissioner of lands of British North Borneo, it appears that gold exists in considerable quantities in that territory. Some natives had brought a little to Sandakan, and Mr. Walker set out to verify its existence in the Sagama district. He searched thirty or forty different places, and found gold at almost every place, generally in small specks, large enough to be gathered with the fingers, sometimes larger, and always in conjunction with a black metallic dust and iron or copper pyrites. The rocks met with were granite, gneiss, quartz, limestone, jasper, porphyries, and red sandstone. Steps will probably be taken to have the whole region thoroughly examined by a competent geologist. The minerals already ascertained to exist in North Borneo are gold, silver, copper, chromium, tin, plumbago, lead, and coal. Antimony and cinnabar are reported. On the west coast, chromium, copper, and arsenic have been found; in the neighborhood of Kinabala, silver ore and pyrites. A sample of native copper has been sent to London. A rich sample of galena and silver, yielding on assay a hundred and fifteen ounces of silver to the ton, has been found. A good deal of information still rests on the rough statements of natives, but British North Borneo is undoubtedly rich in mineral as well as agricultural wealth.

— Professor Karl Gottsche of the University of Kiel, has just returned from his travels in eastern Asia. After having lectured on mineralogy and geology for several years at Tokio, he undertook a scientific exploring expedition in Korea, at the request of the Korean government, which lasted until December, 1884. His route extended over three thousand kilometres. Dr. Gottsche intends shortly to publish his geological, mineralogical, and ethnographical investigations of Korea.

— Professor Huxley is, it is understood, going to retire from the various posts he holds under the English government, on a pension of twelve hundred pounds a year.

— The Berlin society for the advancement of manufacture has offered a prize of fifteen hundred marks for the best essay on the progress, present position, and capability of application, of the photo-mechanic process for the reproduction of drawings, woodcuts, copperplates, oil-paintings, and photographic representations of nature, with a comparative review of its results.

— The commission appointed by the Belgian government to experiment on Pasteur's method of protecting cattle and sheep from anthrax by inoculation with the attenuated virus have published their report. They find, from very numerous vaccinations which have been performed at Hervé since the spring of 1883, on farms where anthrax breaks out every year, that Pasteur's method preserves both sheep and cattle from the disease. No case of anthrax has been observed among a thousand fully-grown cattle which have been vaccinated, while the non-vaccinated have died, as usual. As regards the duration of the protective influence, it has been found to be one year for young animals in the proportion of ninety per cent, and at least two years for all mature animals. They confirm Mr. Pasteur's statement that places where animals which have died of anthrax have been buried are dangerous, the soil retaining the germs.

— The Austrian central tourist club has addressed a petition to the assemblies of all Austrian alpine provinces to pass a law prohibiting the wholesale uprooting of edelweiss now carried on. The petitioners point out that hundreds of thousands of the plants are dug up, and sent abroad, even to America; so that there is a fear that the favorite plant of all lovers of the Alps will be exterminated, except in a few remote places. Several Swiss cantons have passed such a law.

— Professor Milne has been engaged in researches on the oscillations of sea-level in the Kurile Islands. He finds that the two islands Iturup and Kunashiri form the first two of the series of stepping-stones which connect Japan by means of Kamtchatka with Asia. They contain a greater proportion of rounded hills and of deeply cut valleys than any of the islands farther north, and may therefore be regarded as older than those which are built up almost entirely of finely formed volcanic cones. The neighboring island of Urup presents appearances similar to these two. The formation of an island like Iturup probably commenced as a number of volcanic peaks forming islands, which were subsequently elevated, of which there are indications in the stratified rocks and terrace formations. All the appearances, however, which Professor Milne has ascribed to a raising of the land, might, he observes, be also explained by raising and lowering of the sea, such as that which Mr. Croll argues might be produced by the accumulation of ice at the pole; and the fact that the height of the terraces increases northwards appears to confirm this view.

— Mr. J. Macdonald Cameron has printed a report on the bituminous deposits of the Camamie basin of the province of Bahia in Brazil. In addition to the purely commercial portion of the report, there is much interesting information with regard to the various descriptions of these oleaginous deposits. Mr. Cameron has some interesting remarks on the influence of the mangrove on the muddy swamps on the coast. The dirty grayish black mud in which the mangrove vegetation is very luxuriant, resembles that noticeable in England in rivers and streams on the banks of which oil or soap works are situated. He inclines to the opinion that this mud is principally formed by the continuous decomposition of the roots and branches of the mangrove trees. The tidal currents ebb and flow slowly, and hence do not sweep away the mud. Thus abundant food for the tree is insured "as well as a store of oleaginous material for the use of distant generations of human beings."

— The articles of scientific interest in the English general magazine for July are as follows: Grant Allen has an article 'Concerning clover' in the *Gentleman's magazine*, — a very interesting account of the various kinds of clover, the object of the different modes of flowering, and the general points of interest concerning the plant. The science notes in the same magazine, conducted by W. Mattieu Williams, contain a few remarks upon the recent scientific events of popular interest. In *Longman's magazine*, Grant Allen is also the scientific writer of the month. His article entitled 'The first potter,' is a *résumé* of our knowledge of prehistoric pottery. Under the title of 'Recent progress in biology,' in the *Nineteenth century*, Ray Lankester takes up, in an accurate manner, all the recent steps of progress in this science, laying most stress upon Koch's and Caldwell's investigations. The article in the same magazine, entitled 'Transylvanian superstition,' by Mme. Gerard, is a very complete enumeration of the vast number of superstitions of this very superstitious country, which cannot fail to be of great interest to anthropologists. An article in Blackwood's *Edinburgh magazine* on 'Footprints,' proves that the human footprints often found on the rocks in many countries are artificial, and the remnants of the sign-system of the aborigines. The *National review* has an article upon 'Some higher aspects of mesmerism,' by E. Gurney and F. W. H. Myers. The title explains itself, and it is interesting to find the subject so well treated in a general magazine. In the *Contemporary review*, G. J. Romanes publishes his Rede lecture for 1885, — a long dissertation on the relation between 'Mind and motion.' Under the title of 'Dangers of medical specialism,' H. B. Donkin takes an opposite view from that entertained by Dr. M. Mackenzie in a recent article, and urges that specialism in medicine should not be made a trade.

Among the American magazines, there are few really good popular scientific articles. In the *Catholic world*, there is a very popular article of some scientific interest, entitled 'Among insects in a southern city,' by T. F. Gabney. The *Andover review* contains an article by Rev. E. M. Bliss, upon 'Kurdistan and the Kurds,' which is a very good description of the people and the country. The article in the *North-American review* upon the 'Subterranean history of man,' by S. C. Bartlett, is a rehash of the results obtained by the recent investigators of this subject. 'Mohammedans in India,' by F. Marion Crawford, in Harper's, possesses some scientific interest. The *Century* has an article on the 'Gate of India,' with a map, and one upon 'Frank Hatton in North Borneo,' by his father, with notes from the explorer's diary.